NASA awards consolidation contract to Lockheed Martin

In another major step to save money and improve efficiency, NASA selected Lockheed Martin Space Operations Co., of Houston, to manage the agency's human and unmanned spacecraft ground operations under a 10-year contract worth a potential $3.44 billion.

Lockheed Martin will be responsible for work previously performed under 17 different contracts at five NASA facilities, including JSC.

The award was the largest by NASA since its 1996 selection of United Space Alliance, a joint venture of Lockheed Martin and The Boeing Co., for a $12 billion, 10-year contract to run day-to-day management of space shuttle operations. Boeing was Lockheed Martin's lone rival for the Consolidated Space Operations Contract awarded in September.

The Consolidated Space Operations contractor will manage all of NASA's data collection, telemetry and communication operations supporting its Earth-orbiting satellites, planetary exploration and human space flight activities. The contract shifts management responsibility from five NASA centers to a single entity, which is an unprecedented step for an operation of this magnitude. This effort is being closely observed by other government agencies that also are reviewing consolidating their operations.

The basic contract amounts to $1.90 billion for a duration of five years, including a three-month phase-in period. The contract runs from October 1998 to December 2003. The award also contains options totaling $1.54 billion, which includes a five-year extension of the basic effort (January 2004 through December 2008); additional options for work at the Kennedy Space Center; and enhanced mission and data service support to the International Space Station program.

Under the contract guidelines, NASA will adopt a plan that calls for implementing private sector commercial practices, products, services and technology. NASA expects the contractor to reduce overlap, eliminate duplication and increase efficiency by streamlining service delivery processes. NASA also expects Lockheed Martin to "commercialize" or "privatize" government systems where the offset will lower the life-cycle cost of space flight missions.

The range of the contract's services will include data acquisition from a spacecraft, data transmission to the end user, data processing and storage, ground and space communications, and mission control center operations.

The work will be performed at five NASA locations including JSC, Goddard Space Flight Center, Marshall Space Flight Center, Kennedy Space Center and the contractor-operated Jet Propulsion Laboratory. The work will be managed by the Space Operations Management Office at JSC. ■

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STS-95 to demonstrate capabilities of crew, orbiter

to orbit and the space program make the transition into the International Space Station era.

"I look at this mission as a showcase," said Flight Manager Michelle Brekke of the Shuttle Program Office. "Not only of a special crew, but of the capabilities of the orbiter. We're basically exercising every aspect the orbiter has to offer to support research and payload operations."

In all, there are more than 80 payloads and experiments on the flight, many of them with conflicting requirements. The Hubble Space Telescope Orbital Systems Test will require an altitude of 345 miles, which stretches the envelope of shuttle performance. Deploying and retrieving the Spartan 201 solar observation satellite and pointing the International Extreme Ultraviolet Hitchhiker instruments will place high demands on the attitude control propellants. And the microgravity materials experiments will call for a minimum of disturbances, which is tough to achieve between and around the maneuvers needed by the other payloads. The shuttle's robot arm will be used to deploy the two satellites and help test three special vision systems that will be invaluable in helping put together the pieces of the space station.

"This flight had a full complement of things to do and an identity before John Glenn ever got assigned to it," said Lead Flight Director Phil Engelauf. "It is probably the fullest mission that I can remember working. We are running at our limits on crew time, on propellant capability and electrical power capability."

Discovery is scheduled to launch at 1 p.m. CST October 29 amid some of the most extensive news coverage in space program history.

"I wish all flights were covered like this because the American people, the people of the world, need to understand what we're doing in the space program," Brown said. "This one is special because we have Senator Glenn on board. We're thrilled to have that coverage. We're thrilled to have him on board."

Lindsey said Glenn's second trip into orbit foreshadows a future where just about any healthy human will be able to fly in space.

"I *know* that sometime in the future we will fly in space like we fly on commercial airliners today," Lindsey said. "I don't know when that is – a lot of technology hurdles will have to be overcome before we can make it affordable – but that will happen. In a way, he's not only a tie to the past but flying with him is a tie to the future because he's representative of the fact that someday we will be flying everybody into space."

Robinson, who will be joining Glenn on the middeck for launch, said he expects a personal thrill before he gets down to the business of the flight.

"On his first launch, when Glenn got into orbit, the engines cut off and he was in the weightlessness of a microgravity environment, there was nobody there to welcome him to space," Robinson said. "Well, this time I'll get to do that, and I think that'll be an honor."

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The crew and the STS-95 training team, working closely with the Mission Control team – especially Flight Activities Officers Roger Smith and Terry Schneider, Propellant Officers Lonnie Schmidt and Cathy Larson and Rendezvous Officer Dave Harshman – have spent many hours working out the best way to juggle the conflicting schedule and performance requirements of the various STS-95 objectives.

"There are over eighty payloads on the flight, the majority of which involve considerable crew intervention," Parazynski said, "so it's a very exciting and challenging mission and it's very fortunate that we have such an experienced crew to tackle all these very exciting payloads."

"We're going to try to help each other to make sure that everything gets done exactly right and nobody misses one of these important steps on the procedures to conduct the science or the operations," said European Space Agency astronaut Duque, the first Spaniard to fly in space.

JSC Photo S98-08741 by Joe McNally, National Geographic, for NASA

Three crew members in training for the STS-95 mission check out a training version of a blood centrifuge that will accompany them aboard *Discovery* later this month. In the foreground (from the left) are Scott Parazynski and Pedro Duque, mission specialists, and U.S. Sen. John Glenn Jr., payload specialist. Duque, representing the European Space Agency, has his right hand on the centrifuge. Sen. Glenn holds a vial of blood that would be placed inside the centrifuge. Among those in the background is Astronaut Stephen Robinson (left side of frame), STS-95 mission specialist.

The mission's prime objective, deployment and retrieval of the Spartan 201 satellite, will reprise activities attempted unsuccessfully on STS-87 when the satellite had to be manually retrieved during a space walk. Procedures and software have been revised, but the crew will be taking special care to ensure the satellite is freed to make its important observations.

"On STS-87, when we released the robot arm from the satellite, the satellite did not do that pirouette maneuver, and so it was a dead satellite sitting there," Lindsey said. "When we finally get to the step where we're ready to pull it out and we're ready to deploy it, we will have something on the screen that tells us, 'Yes, this satellite is go for deploy. All the actions that need to be done have been done to make this thing go.'"

Since aging and space flight share a number of similar physiological responses, the study of space flight may provide a model to help scientists interested in understanding aging. Some of these similarities include bone and muscle loss, balance disorders, and sleep disturbances and those will be the focus of Glenn's work.

Glenn's age will be a key variable that researchers keep in mind as they collect important, initial observational information on the interaction of space flight and aging. This is a new area of interest and research just beginning with STS-95. Scientists will be using pre- and post-flight samples and on-orbit measurements to look at areas where the effects of aging and space flight appear to be parallel, specifically bone and muscle density, balance, blood pressure, sleep and immune systems. When astronauts go into space they have these changes, but they reverse once they readapt to Earth.

"What you're trying to find out is, 'What within the human body turns these systems on and off?'" the 77-year-old Glenn said. "If we can learn some things like that, we not only can do a lot to take away some of the frailties of old age with osteoporosis and immune system changes, muscle degradation, things like that, but also help the astronauts up there now that have these things affect them in space."

Glenn, who will be the oldest human to fly in space, said researchers at the National Institute on Aging will seek to determine if his age is a factor in his body's adaptation to microgavity.

"Would I be immune then, basically, from those changes that the younger astronauts experience? If that would occur, why? Would it affect me more? If so, why? When you come back to Earth, what's the rate of recovery? If there's a different rate of recovery between someone my age and the younger astronauts, why does that occur?" Glenn said.

Most of the simulations are behind the flight control team and crew, which have learned a lot that has been incorporated into the procedures and mission plans, Engelauf said. "Now we have only the last few sims and the flight readiness review is coming up in a couple of weeks. I think we're in pretty good shape here about four weeks before launch." ■